

At pages 4-5 of the Office Action, the Examiner objects to the specification as failing to provide proper antecedent basis for the claimed subject matter. More specifically, the Examiner states that the phrase “magnetic carrier particles,” found in claims 16-29 and 35-39, lacks antecedent basis because the text at the identified pages of the specification only mentions “hard magnetic particles.” The Examiner notes that to overcome the objection, the applicants merely have to include the objected claim language in the specification. For the following reasons, this objection is respectfully traversed.

In accordance with the Examiner’s remarks, the phrase “magnetic carrier particles,” has been added in the specification. Accordingly, the objection should be withdrawn.

At page 5 of the Office Action, the Examiner indicates that should claim 21 be found to be allowable, claim 43 will be objected to as a substantial duplicate thereof, under the provisions of 37 CFR 1.75. For the following reasons, this objection is respectfully traversed.

In accordance with the Examiner’s remarks, claim 43 has been cancelled.

Also at page 5, the Examiner acknowledges the meaning of the term “2’/10’ MECCA charge ratio” as defined in the present application and used in some of the claims, but makes no further comment.

At pages 6-9 of the Office Action, the Examiner rejects claims 30 and 35 under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,074,795 to Watanabe et al., or in the alternative, as obvious under 35 U.S.C. §103(a) by virtue of the same patent. The Examiner characterizes Watanabe et al. as showing a developer containing carrier particles and a toner. The toner contains toner particles mixed with hydrophobized silica particles HDK2000. The toner particles also contain a binder resin, a charge control agent, and a releasing composition. Releasing composition D contains polyethylene wax as the releasing agent and silica particles HDK2000. The carrier

particles can contain iron powder, ferrite powder, magnetite, and nickel powders.

The Examiner admits that Watanabe et al. does not show a toner with the designated 2'/10' MECCA charge ratio. More specifically, the Examiner admits that Watanabe et al. does not show that the toner has a charge rate such that the charge ratio is from about 0.9 to about 1.1, as recited in claim 30 of the claimed invention. However, the Examiner points out that the Watanabe et al. toner discussed in example 4 appears to have a fairly constant charge initially and after 100,000 copies. Therefore, the Examiner assumes that because the Watanabe toner maintains a substantially constant charge ratio as noted above, it is reasonable to conclude that the Watanabe toner has a ratio of 1.0 of the charge after two minutes of charging to the charge after ten minutes of charging, which meets the charge limitation recited in the present claim 30. The Examiner further notes that the burden is on the applicants to prove otherwise and cites In re Fitzgerald, 205 U.S.P.Q. 594 (1980).

The Examiner responds to the arguments of the applicants in the previous response, and generally states that those arguments are not persuasive. More specifically, after some discussion, the Examiner states that a person of ordinary skill in the art would not have expected that the charge at two minutes to differ substantially from the "virtually identical" values at zero minutes and at greater than ten minutes. Therefore, the Examiner concludes that it is reasonable to presume that Watanabe's toner has a charge ratio within the limitation recited in claim 30. For the following reasons, this rejection is respectfully traversed.

Claim 30 and the claims dependent thereon recite toner particles having a charge rate such that the 2'/10' MECCA charge ratio is from about 0.9 to about 1.1. As the Examiner appreciates by her comments earlier in the Office Action, the present application describes the MECCA test which is a charging rate and this test measures how quickly toners can reach a desirable charge level in a short amount of time and further maintain this desirable charge level

over a period of time. In this test, the level of charge of the same toner (without replenishment) in two minutes of charging and after ten minutes of charging is measured.

The Examiner asserts that Watanabe et al., in example 4, describes initial charges and charges after a 100,000 copies. However, this is an unfair comparison with the MECCA test set forth in claim 30. The MECCA test is a test of aged toner but without making any actual copies. As such, in the MECCA test, the same toner is used over and over again without replenishing the used toner with new toner. Thus, in the MECCA test, new toner is not added at all during the test. The MECCA test, therefore, determines the charge stability of the same toner by measuring the charge rate of an aged toner without any replenishment of the aged toner. The 100,000 copy test in Watanabe et al. is significantly different than the MECCA test. Watanabe et al. makes actual copies; therefore, the toner is replenished during the test. Thus, the charge rate measured in Watanabe et al. is not the charge rate of aged toner, but instead is the charge rate of replenished toner that never ages because it is used and replenished. As those skilled in the art know, comparing the charge stability of new toner (for a few seconds) with aged toner (for 10 minutes) is comparing apples with oranges. Therefore, the test in Watanabe et al. and the MECCA test are completely different tests.

Additionally, the initial charge quantity referenced in Watanabe et al., including Table 1 of Watanabe et al., is different from the two minute charging of the present application. As shown in the present application and the examples, the two minute MECCA test involved mixing the carrier particles and toner particles together and then immediately determining the level of charge obtained in two minutes of charging and determining the level of charge of the same toner after ten minutes. The applicants note that with respect to the initial charge quantity referenced in Watanabe et al., there is no mention that the initial charge quantity was measured after two

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minutes of charging. One skilled in the art would understand that the "initial charge quantity" does not involve mixing together the carrier particles with the toner and charging immediately for two minutes but involves forming the two component developer and placing the two component developer in a copier for some time and then running the experiment. Thus, there is no teaching or suggestion in Watanabe et al. with respect to forming the developer and then immediately charging for two minutes.

The applicants further direct the Examiner's attention to column 7, lines 23-40 of Watanabe et al. which further indicates that the two component developer of Watanabe et al. was first set in a copier and the running test was performed in which a 100,000 images were reproduced. However, the applicants direct the Examiner's attention to the fact that 5,000 paper sheets were first fed through the fixing roller of the copier before running the test to remove residual silicone oil. Thus, a significant amount of time elapsed prior to the initial measurement of the initial charge quantity of the toner. In addition, the time of measuring the "charge quantity after running the test," namely after running 100,000 images would be significantly after ten minutes. As the Examiner can surely appreciate, this copier did not form 100,000 images in ten minutes since this would amount to 10,000 copies per minute. Thus, this further proves that the Examiner's comparison of the initial charge quantity and the charge quantity after running the test is not a fair comparison with the MECCA test as described in claim 30 and the claims dependent thereon. Accordingly, the information relied upon by the Examiner in Watanabe et al. with respect to the charge quantity would not teach or suggest the claimed invention.

With respect to Examiner's comment that one skilled in the art would not have expected that the charge at two minutes to differ substantially from the "virtually identical" values at zero minutes and at greater than ten minutes, the Examiner's comment is not supported by any one

skilled in the art, as evidenced in the enclosed article, by Nash et al. entitled "Toner Charge Instability." This article is an in-depth study of the aging effects in a typical toner and indicates that the greatest drop in charge occurs during the first 10 minutes. This is clearly shown in figure 7 of Nash et al. Thus, the Examiner's comment that one skilled in the art would not expect that the charge in two minutes to differ substantially from the charge in 10 minutes is inaccurate.

Moreover, Nash et al. indicates that steady addition of replenisher, which is a toner-rich mixture of toner and carrier particles, to a working developer (coupled with an equivalent draining-off of partially-used developer) allows an otherwise aging developer to stabilize at a functional equilibrium value. Also, attached are two data sheets from Orient and Hodogawa showing that it is a lot easier to obtain a stable charge for very long runs, but it is very difficult to achieve this stability between 2' and 10' minutes. Thus, the MECCA test, which does not replenish can not be compared to the Watanabe et al. test, which uses a replenished toner. The MECCA test is a very harsh test of the toner and its ability to hold a charge. The test of Watanabe et al. is a test of replenished toner and not aged toner. Clearly, Watanabe et al. does not teach or suggest the properties claimed in the present invention. Accordingly, the rejection under 35 U.S.C. §102(e) or 103(a) should be withdrawn.

At pages 9-10 of the Office Action, the Examiner rejects claim 42 under 35 U.S.C. §102(e) as being anticipated by Watanabe et al. The Examiner repeats a previous characterization of this reference, and then responds to the argument advanced in the last response, i.e., that Watanabe's silica particles are not present in the toner resin, as specifically recited in claim 42. However, the Examiner states that Watanabe's releasing composition D (which contains silica) is dispersed in the toner binder resin of Watanabe's toner particles. Therefore, the Examiner concludes that Watanabe's silica particles (dispersed in releasing composition D) are present in the toner binder

resin. For the following reasons, this rejection is respectfully traversed.

Claim 42, in part, recites that the inorganic particles comprise colloidal silica. However, Watanabe et al. in column 3, lines 9-30 refers to “hydrophobized silica” which has different properties and characteristics than colloidal silica. In fact, colloidal silica is dispersible in water while hydrophobized silica is not. Thus, Watanabe et al. does not teach or suggest colloidal silica. Accordingly, the rejection under 35 U.S.C. §102(e) over Watanabe et al. should be withdrawn.

At pages 10-12 of the Office Action, the Examiner rejects claims 1-4, 7, and 16 under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al.

The Examiner repeats her characterization of Watanabe et al. and notes the amounts of the components of the resin. The Examiner admits that the amount of the internal silica particles of Watanabe et al. (1.6%) is outside the range recited in claim 1 (about 0.1 to about 0.5%).

However, the Examiner states that Watanabe et al. shows that the releasing agent can be preferably used in the amount of 0.5 to 20 wt.%. The Examiner notes that if one adjusts the amount of the polyethylene wax in Watanabe et al. to 0.5 wt.%, based on the weight of the toner particles, then the amount of the silica particles would be about 0.3 wt.%, which would fall in the range of the claimed invention. For the following reasons, this rejection is respectfully traversed.

The inorganic particles of the claimed invention are colloidal inorganic particles, like colloidal silica. However, the silica in Watanabe et al. is hydrophobized silica, which has different properties and characteristics than colloidal inorganic particles as described above (e.g., one is dispersible in water and the other is not). Thus, one skilled in the art would not substitute the hydrophobized silica of Watanabe et al. with the colloidal inorganic particles of the claimed invention.

Additionally, it appears that the Examiner is using hindsight to create the claimed invention.

There is no teaching in Watanabe et al. that would indicate that using the lowest amounts of releasing agent set forth in Watanabe et al. would produce the beneficial properties listed by the Examiner. Moreover, the Examiner's calculations are not completely valid. For instance, if the amount of polyethylene wax was reduced to the lowest level based on column 4, lines 57-63, this would change the ratio of silica to wax set forth in Example 4 for the preparation of releasing composition D (column 9, lines 60-65) or the amounts of releasing composition D mixed with the other ingredients, as set forth at column 10, lines 5-10. Accordingly, for these reasons, this rejection should be withdrawn.

At pages 12-14 of the Office Action, the Examiner rejects claims 5, 10, and 19 under 35 U.S.C. §103(a) as unpatentable over Watanabe et al. as applied to claim 1, further combined with Kawasaki et al. (U.S. Patent No. 5,230,978). The Examiner repeats her previous remarks as to Watanabe et al. and admits that Watanabe's toner does not show the binder recited in claim 5, but notes that the binder resins can include the resins used in conventional toners. The Examiner states that Kawasaki et al. shows a toner binder resin using a cross-linked styrene-acrylate copolymer that is within the limitation recited in claim 5.

Additionally, the Examiner states that claim 10 is written in a product-by-process format. The Examiner believes that Kawasaki's co-polymer meets the compositional limitations recited in claim 5. Additionally, the Examiner believes Kawasaki's co-polymer appears to be the same or substantially the same as the toner resin made by the "limited coalescence" process recited in the present claim 10, and that the burden is on the applicants to prove otherwise. The Examiner further notes that it would have been obvious for a person having ordinary skill in the art, in view of the teachings of Kawasaki et al., to use a cross-linked styrene-acrylate co-polymer as the binder resin, because that person would have had a reasonable expectation of successfully obtaining a developer

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capable of being used in a high speed copier, and providing high quality images without fog when fixed at low temperatures. For the following reasons, this rejection is respectfully traversed.

The previous arguments with respect to Watanabe et al. apply equally here. Kawasaki et al. does not teach or suggest any of the above-noted deficiencies of Watanabe et al.

Moreover, claims 5, 10, and 19 are dependent directly or indirectly on claim 1. Therefore, the reasons set forth above with respect to the patentability of claim 1 would also apply here. Accordingly, the rejection under 35 U.S.C. § 103 should be withdrawn.

At pages 14-15 of the Office Action, the Examiner rejects claim 6 under 35 U.S.C. §103(a) as unpatentable over Watanabe et al. as applied to claim 1, further combined with Sukata et al. (U.S. Patent No. 5,990,332). The Examiner repeats the previous arguments with regard to Watanabe et al. and admits that Watanabe's toner does not show an organo iron complex charge agent, as recited in present claim 6. However, the Examiner believes that Watanabe et al. shows that the charge control agent can include one or more known charge control agents, such as metal complexes of monoazo dyes, and iron complexes of salicylic acid, dialkylsalicylic acids, and other identified acids. The Examiner further remarks that Sukata et al. shows charge controlling iron complexes as represented by formula (I) of that patent. Therefore, the Examiner believes that it would have been obvious for a person having ordinary skill in the art, in view of the teachings of Watanabe et al. and Sukata et al., to use an iron complex of an aromatic hydroxycarboxylic acid as the charge control agent in Watanabe's toner, because that person would have had a reasonable expectation of successfully obtaining a developer having the benefits disclosed by Sukata et al. For the following reasons, this rejection is respectfully traversed.

Sukata et al. relates to charge control agents that might be combinable with any other general reference relating to toners. However, Sukata et al. does not overcome any of the



deficiencies previously noted with respect to Watanabe et al., and therefore even a combination of Watanabe et al. with Sukata et al. would still not teach or suggest the claimed invention. Moreover, claim 6 is dependent directly on claim 1. Therefore, the reasons set forth above with respect to patentability of claim 1 would also apply here. Accordingly, the rejection under 35 U.S.C. §103(a) should be withdrawn.

At pages 15-17 of the Office Action, the Examiner rejects claims 8, 9, 11-14, 17, 18, 20 – 23, 25, and 43 under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al. combined with Kawasaki et al., as applied to claim 1 above, and further combined with Sukata et al. The Examiner repeats the previous remarks regarding the teachings of Watanabe et al. and Kawasaki et al. as set forth in the Office Action. The Examiner admits that Watanabe's toner in example 4 does not show an organo-iron complex charge agent, as recited in claims 8, 11, 12, and 14. However, the Examiner asserts that Watanabe et al. shows that the charge control can include one or more known charge control agents, such as metal complexes of monoazo dyes, and iron complexes of salicylic acid and various other identified acids. The Examiner then notes that Sukata et al. shows charge controlling iron complexes, and repeats her previous remarks as to that reference. Finally, the Examiner states that it would have been obvious for a person skilled in the art to use the Sukata et al. charge control agent in a toner derived from Watanabe et al. and Kawasaki et al., with the expectation of obtaining a developer having the beneficial properties shown by Sukata et al. For the following reasons, this rejection is respectfully traversed.

The previous arguments with respect to Watanabe et al. apply equally here. Sukata et al. and Kawasaki et al. do not supply any of the deficiencies previously noted with respect to Watanabe et al., and therefore even a combination of the three references would not teach or suggest the claimed invention. Moreover, claims 8, 9, 11-14, 17, 18, 20-23, and 25 are dependent directly or

indirectly on claim 1. Therefore, the reasons set forth above with respect to patentability of claim 1 would also apply here. Accordingly, the rejection under 35 U.S.C. § 103(a) should be withdrawn. With respect to claim 43, claim 43 has been cancelled.

At pages 17-18 of the Office Action, the Examiner rejects claims 25-27 under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al., combined with Kawasaki et al. and Sukata et al. as applied to claim 21 above, further combined with Saha (U.S. Patent No. 5,500,320). The Examiner reiterates the previous remarks regarding Watanabe et al., Kawasaki et al., and Sukata et al. made earlier in the Office Action. The Examiner admits that Watanabe et al. does not show that the carrier particles can comprise strontium ferrite particles, as recited in the present claims. However, the Examiner asserts that Watanabe et al. shows that the carrier particles can contain ferrite particles coated with a resin. The Examiner characterizes Saha as showing hard magnetic carrier particles having strontium ferrite particles coated with a polymeric coating. According to the Examiner, Saha shows that the carrier particles provide developer compositions for magnetic brush development having high development speeds without loss of copy image quality. The Examiner states that it would have been obvious for one skilled in the art, in view of the teachings of Saha, to use Saha's strontium ferrite resin coated particles as the carrier particles in the developer generated through the combined teachings of Watanabe et al., Kawasaki et al., and Sukata et al., because that person would have had a reasonable expectation of successfully obtaining a developer capable of being used for magnetic brush development having high speeds, without loss of copy image quality. For the following reasons, this rejection is respectfully traversed.

It appears the Examiner is attempting to recreate the claimed invention through elements

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selected from various elements of the cited references. Saha does not overcome any of the deficiencies noted with respect to Watanabe et al., or any of the other references cited by the Examiner (Kawasaki et al. and Sukata et al.). Moreover, claims 25-27 are indirectly dependent on claim 1. Therefore, the reasons set forth above with respect to patentability of claim 1 would also apply here. Accordingly, the rejection under 35 U.S.C. §103 should be withdrawn.

At pages 18-19 of the Office Action, the Examiner rejects claims 28 and 29 under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al. combined with Kawasaki et al., Sukata et al., and Saha as applied to claim 27, further combined with Creatura (U.S. Patent No. 5,102,769). The Examiner repeats the previous remarks with respect to the teachings of Watanabe et al., Kawasaki et al., Sukata et al., and Saha recited earlier in the Office Action. The Examiner admits that Saha does not teach that the strontium ferrite carrier particles are coated with a blend of polymers, as recited in claims 28 and 29. However, the Examiner asserts that Saha teaches that the carrier particles can be coated with a resin. According to the Examiner, Creatura shows that magnetic carrier particles can be coated with a polymeric coating comprising a blend of various fluorine based polymers in a weight ratio of 3 to 2. According to the Examiner, this ratio meets the ratios recited in claim 29. The Examiner also asserts that Creatura shows that developers containing the carrier particles provide images having desirable properties. The Examiner states that it would have been obvious for a person having ordinary skill of the art, in view of the teachings of Creatura, to coat Saha's strontium ferrite carrier particles with Creatura's polymer coating and to use those carrier particles in the developer generated through combined teachings of Watanabe et al., Kawasaki et al., Sukata et al., and Saha, because that person would have had a reasonable expectation of successfully obtaining a developer capable of providing toner images having the good characteristics as taught by Creatura. For the following reasons, this rejection is

respectfully traversed.

Creatura does not overcome any of the deficiencies noted with respect to Watanabe et al., or any of the other secondary references cited by the Examiner (Kawasaki et al., Sukata et al., and Saha). Moreover, claims 28-29 are indirectly dependent on claim 1. Therefore, the reasons set forth above with respect to patentability of claim 1 would also apply here. Accordingly, the rejection under 35 U.S.C. § 103(a) should be withdrawn.

At page 22 of the Office Action, the Examiner rejects claims 1-4, 16, and 42 under 35 U.S.C. §102(b) as being anticipated by Nakamura et al. (U.S. Patent No. 5,863,692). More specifically, the Examiner cites toner “J” (example 6 at column 14) and states that the hydrophobic silica is present in an amount of 0.15%, which is within the range recited in claim 1 (0.1 to about 0.5%). The Examiner also states that the toner is mixed with a carrier, making a two-component developer. For the following reasons, this rejection is respectfully traversed.

Nakamura et al. in col. 12 shows that the silica is a hydrophobic silica. Nakamura et al. does not teach or suggest colloidal inorganic particles, such as colloidal silica of the claimed invention. As stated earlier, hydrophobic silica has different properties than colloidal silica, and one skilled in the art would not substitute a hydrophobic silica with a colloidal silica. Thus, Nakamura et al. does not teach or suggest the claimed invention. Accordingly, the rejection under 35 U.S.C. §102(a) should be withdrawn.

At pages 22-23 of the Office Action, the Examiner rejects claims 10 and 19 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being obvious over Nakamura et al. (U.S. Patent No. 5,863,692). The Examiner reiterates the previous comments about Nakamura et al., and then states that claim 10 is written in a product-by-process format. Ultimately, the Examiner states that the resin of Nakamura et al. is the same as the resin

made by the "limited coalescence" method of claim 10, and that the burden is on the applicants to prove otherwise. For the following reasons, this rejection is respectfully traversed.

The "limited coalescence" method described at page 8, lines 8-10 of the present application is a specialized suspension polymerization process for making a styrene-acrylic resin, as shown, for instance, in U.S. Patent No. 4,912,009. The details of that preferred process are set forth in the Amerling et al. patent at column 2, line 65 to column 3, line 21 and various improvements are noted at column 5, lines 6-24. The Examiner has not pointed to any portion of Nakamura et al. that teaches or suggests a suspension polymerization process for making a styrene-acrylic resin. The bulk of Nakamura et al. is directed to an organo-boron compound having the formula recited in the abstract. The portions of Nakamura et al. that refer to resins (column 8, line 36 to column 9, line 13) merely infer that conventional resins can be used. There is no teaching or suggestion that a specialized resin prepared from a "limited coalescence" process is used in Nakamura et al. Furthermore, claims 10 and 19 are dependent directly or indirectly on claim 1. Therefore, the reasons set forth above with respect to the patentability of claim 1 would also apply here. Accordingly, for these reasons, this rejection should be withdrawn.

At pages 23-24 of the Office Action, the Examiner rejects claims 31 and 36 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being obvious over Nakamura et al. (U.S. Patent No. 5,863,692). The Examiner reiterates the previous comments about Nakamura et al., and then states that it is reasonable to assume that Nakamura's toner has a charge ratio that is within the ratio recited in claim 31, and cites In re Fitzgerald, 205 U.S.P.Q. 594 (1980). For the following reasons, this rejection is respectfully traversed.

Claims 31 and 36 are dependent directly or indirectly on claim 1. Therefore, the reasons set forth above with respect to the patentability of claim 1 would also apply here. Accordingly, this

rejection should be withdrawn.

At pages 24-25 of the Office Action, the Examiner rejects claims 5, 10, and 19 under 35 U.S.C. §103(a) as being unpatentable over Nakamura et al. (U.S. Patent No. 5,863,692) combined with Kawasaki et al. (U.S. Patent No. 5,230,978). More specifically, the Examiner reiterates the previous comments as to Nakamura et al. and Kawasaki et al., and states that it would have been obvious for a person of ordinary skill in the art to use the cross-linked copolymer of Kawasaki et al. in the toner “J” shown in Nakamura et al., to achieve the various beneficial properties noted. For the following reasons, this rejection is respectfully traversed.

Claims 5, 10, and 19 are dependent directly or indirectly on claim 1. Therefore, the reasons set forth above with respect to the patentability of claim 1 would also apply here. Accordingly, the rejection under 35 U.S.C. §103(a) over Nakamura et al. in view of Kawasaki et al. should be withdrawn.

At pages 25-26 of the Office Action, the Examiner rejects claim 7 under 35 U.S.C. §103(a) as being unpatentable over Nakamura et al. combined with Akimoto et al. (U.S. Patent No. 5,707,772). More specifically, the Examiner admits that Nakamura et al. does not show a polyethylene releasing agent as recited in claim 7. However, Akimoto et al. does show such a releasing agent, and the Examiner states that it would have been obvious for a person of ordinary skill in the art to use the polyethylene releasing agent of Akimoto et al. in the toner “J” of Nakamura et al., in hopes of achieving the beneficial results stated by the Examiner. For the following reasons, this rejection is respectfully traversed.

Claim 7 is dependent directly on claim 1. Therefore, the reasons set forth above with respect to the patentability of claim 1 would also apply here. Accordingly, the rejection under 35 U.S.C. §103(a) over Nakamura et al. in view of Akimoto et al. should be withdrawn.

At page 26 of the Office Action, the Examiner states that claims 40 and 41 are allowable over the prior art, and also indicates that claims 15, 24, 32-34, and 37-39 are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form, including all the limitations of the base claim and any intervening claims.

The applicants appreciate the Examiner's indication that claims 40 and 41 are allowable and that claims 15, 24, 32-34, and 37-39 would be allowable over the cited prior art of record if written in independent form, including all the limitations of the base claim and any intervening claims. The applicants believe that in view of the above comments, the remaining claims are allowable as well.

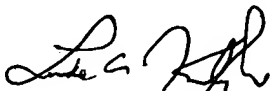
Should the Examiner believe that there are any remaining questions with respect to patentability of the present invention over the cited art, the Examiner is encouraged to contact the undersigned by telephone.

### **CONCLUSION**

In view of the foregoing remarks, Applicants respectfully request the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 50-0925. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Luke A. Kilyk', is written over the printed name.

Luke A. Kilyk  
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Enclosure: Petition for two-month Extension of Time; Nash et al. "Toner charge Instability";  
Technical information, Orient Chemical Industries, LTD.



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION**

Please replace the paragraph starting at page 10, line 14 and ending at page 11, line 3 with the following paragraph:

The surface treatment with a surface treatment agent or a spacing agent preferably reduces the attraction between the toner particles and magnetic carrier particles, such as the hard magnetic carrier particles to a degree sufficient that the toner particles are transported by the carrier particles to the development zone where the electrostatic image is present and then the toner particles leave the carrier particles due at least in part to the sufficient electrostatic forces associated with the charged image. Accordingly, the preferred toner particles of the present invention permit attraction with the magnetic carrier particles but further permit the stripping of the toner particles from the hard magnetic carrier particles by the electrostatic and/or mechanical forces and with surface treatment on the toner particles. In other words, the spacing agent on the surface of the toner particles, as indicated above, is sufficient to reduce the attraction between the toner particles and the hard magnetic carrier particles such that the toner particles can be stripped from the carrier particles by the electrostatic forces associated with the charged image or by mechanical forces.

Please replace the paragraph on page 12, line 11 with the following paragraph:

The wax is preferably present in an amount of from about 0.1 to about 10 wt% and more preferably in an amount of from about 0.5 to about 5 wt% based on the toner weight, and more preferably about 1.8 wt%. Examples of suitable waxes include, but are not limited to, polyolefin waxes, such as low molecular weight polyethylene, polypropylene, copolymers thereof and mixtures thereof. In more detail, more specific examples are copolymers of ethylene and propylene preferably having a molecular weight of from about 1000 to about 5000 g/mole, particularly a

copolymer of ethylene and propylene having a molecular weight of about 1200 g/mole. Additional examples include synthetic low molecular weight polypropylene waxes preferably having a molecular weight from about 3,000 to about 15,000 g/mole, such as a polypropylene wax having a molecular weight of about 4000 g/mole. Other suitable waxes are synthetic polyethylene waxes. Suitable waxes are waxes available from Mitsui Petrochemical, Baker Petrolite, such as [Polywax] POLYWAX 2000, [Polywax] POLYWAX 3000, and/or [Unicid] UNICID 700; and waxes from Sanyo Chemical Industries such as [Viscol] VISCOL 550P and/or [Viscol] VISCOL 660P. Other examples of suitable waxes include waxes such as [Licowax] LICOWAX PE130 from Clariant Corporation.

Please replace the paragraph at page 13, line 2 with the following paragraph:

The development system of the present invention preferably contains a supply of dry developer mixture which includes toner and magnetic carrier particles, such as hard magnetic carrier particles. The toner is preferably present in an amount of from about 5 wt% to about 15 wt%, and preferably about 10 wt% based on the weight of the developer.

Please replace the paragraph starting on page 13, line 20 and ending on page 14, line 17 with the following paragraph:

The set up of the development system is preferably a digital printer, such as a Heidelberg [Digimaster] DIGIMASTER 9110 printer using a development station comprising a non-magnetic, cylindrical shell, a magnetic core, and means for rotating the core and optionally the shell as described, for instance, in detail in U.S. Patent Nos. 4,473,029 and 4,546,060, both incorporated in their entirety herein by reference. The development systems described in these patents can be adapted for use in the present invention. In more detail, the development systems described in these patents preferably use hard magnetic carrier particles. For instance, the hard magnetic carrier

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particles can exhibit a coercivity of at least about 300 gauss when magnetically saturated and also exhibit an induced magnetic moment of at least about 20 EMU/gm when in an externally applied field of 1,000 gauss. The magnetic carrier particles can be binder-less carriers or composite carriers. Useful hard magnetic materials include ferrites and gamma ferric oxide. Preferably, the carrier particles are composed of ferrites, which are compounds of magnetic oxides containing iron as a major metallic component. For example, compounds of ferric oxide,  $\text{Fe}_2\text{O}_3$ , formed with basic metallic oxides such as those having the general formula  $\text{MFeO}_2$  or  $\text{MFe}_2\text{O}_4$  wherein M represents a mono- or di-valent metal and the iron is in the oxidation state of +3. Preferred ferrites are those containing barium and/or strontium, such as  $\text{BaFe}_{12}\text{O}_{19}$ ,  $\text{SrFe}_{12}\text{O}_{19}$ , and the magnetic ferrites having the formula  $\text{MO} \cdot 6 \text{Fe}_2\text{O}_3$ , wherein M is barium, strontium, or lead as disclosed in U.S. Patent No, 3,716,630 which is incorporated in its entirety by reference herein. The size of the magnetic carrier particles useful in the present invention can vary widely, and preferably have an average particle size of less than 100 microns, and more preferably have an average carrier particle size of from about 5 to about 45 microns.

Please replace the Table at page 22, line 18 with the following Table:

Table 1

| Chemical                                     | Trade name                                   | Manufacturer         | Weight % |
|--|--|----------------------|----------|
| Crosslinked styrene butyl acrylate copolymer | SB77XL                                       | Eastman Kodak        | 90%      |
| Carbon Black                                 | [Black Pearls]<br><u>BLACK PEARLS</u><br>430 | Cabot Corp           | 6.4%     |
| Polyethylene wax                             | [Licowax]<br><u>LICOWAX</u> PE130            | Clariant Corporation | 1.8%     |
| Iron organic chelate charge control agent    | T77  | Hodogaya             | 1.8%     |

Please replace the paragraph on page 24, line 3 with the following:

The toner of the present application was then added to form a developer formulation. Carriers are prepared from uncoated  $\text{SrFe}_{12}\text{O}_{19}$  core from Powdertech Corporation of Valparaiso, Inc. The material is prepared via a spray drying process as described in U.S. Patent No. 6,228,549, incorporated in its entirety by references herein. The volume median is 25-30 microns.

Please replace the paragraph on page 24, line 8 with the following:

The dry powder coatings of Kynar/poly(methylmethacryate) were prepared from [Kynar] KYNAR 301F from Elf Atochem North America and poly(methylmethacryate) MP 1201 manufactured by Soken. The appropriate amount of each dry powder was weighed and added to the uncoated core. The ferrite/polymer mixture was roll milled for 15 minutes; sieved to remove any unbroken agglomerates, and then rolled another 15 minutes. The mixture was loaded into dishes or trays for curing. The curing was done by either introducing the material into a hot oven, or by ramping a cool oven to the dwell temperature, followed by a cool-down step. The cure temperature ranged from 190-250° C for 1-3 hours. After curing, the carrier was deagglomerated by sieving through a 230 mesh screen.

#### IN THE CLAIMS

1. (Twice Amended) Toner particles comprising at least one toner resin, at least one charge control agent, at least one surface treatment agent, and optionally at least one release agent or colorant or both, wherein inorganic particles are present in said toner resin and said surface treatment agent is present on the surface of said toner particles, wherein said inorganic particles are colloidal inorganic particles and are present in an amount of from about 0.1 weight % to about 0.5 weight %, based on the weight of the toner.

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42. (Amended) A developer comprising toner particles and magnetic carrier particles, wherein said toner particles comprise toner particles comprising at least one toner resin, at least one charge control agent, at least one surface treatment agent, and optionally at least one release agent or colorant or both, wherein inorganic particles are present in said toner resin and said surface treatment agent is present on the surface of said toner particles, and wherein said inorganic particles comprise colloidal silica.